Ejercicios 4.2

1. Determinar u+v, u-v, 2u y 3u-2v si:

a.

```
sage] u= vector([1,2,-3])
sage] v= vector([0,1,-2])
sage] u
```

$u = (1, 2, -3)$

```
sage] v
```

$v = (0, 1, -2)$

```
sage] u+v
```

$u + v = (1, 3, -5)$

```
sage] u-v
```

$u - v = (1, 1, -1)$

```
sage] (2*u)
```

$2u = (2, 4, -6)$

```
sage] (3*u)-(2*v)
```

$3u - 2v = (3, 4, -5)$

b.

```
sage] u= vector([4,-2,1,3])
sage] v= vector([-1,2,5,-4])
sage] u
```

$u = (4, -2, 1, 3)$

```
sage] v
```

$v = (-1, 2, 5, -4)$

```
sage] u+v
```

$u + v = (3, 0, 6, -1)$

```
sage] u-v
```

$u - v = (5, -4, -4, 7)$

```
sage] 2*u
```

$2u = (8, -4, 2, 6)$

```
sage] (3*u)-(2*v)
```

$3u - 2v = (14, -10, -7, 17)$

2. Repita el ejercicio 1 para:

a.

```
sage] u= vector([2,0,-4])
```

$$u = \begin{pmatrix} 2 \\ 0 \\ -4 \end{pmatrix}$$

```
sage] v= vector([3,2,1])
```

$$v = \begin{pmatrix} 3 \\ 2 \\ 1 \end{pmatrix}$$

```
sage] (u+v)
```

$$u + v = \begin{pmatrix} 5 \\ 2 \\ -3 \end{pmatrix}$$

```
sage] (2*u)
```

$$2u = \begin{pmatrix} 4 \\ 0 \\ -8 \end{pmatrix}$$

```
sage] ((3*u)-(2*v)).transpose()
```

$$3u - 2v = \begin{pmatrix} 0 \\ -4 \\ -14 \end{pmatrix}$$

10. Determine la longitud de los siguientes vectores
a. (1,2,-3)

```
sage] u= vector([1,2,-3])
sage] u.norm()
```

$\sqrt{14}$

b. (2,3,-1,4)

```
sage] v= vector([2,3,-1,4])
sage] v.norm()
```

$\sqrt{30}$

c. (1,0,3)

```
sage] t= vector([1,0,3])
sage] t.norm()
```

$\sqrt{10}$

d. (0,0,3,4)

```
sage] e= vector([0,0,3,4])
sage] e.norm()
```

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11. Determine la longitud de los siguientes vectores:
a. (2,3,4)

```
sage] u= vector([2,3,4])
sage] u.norm()
```

$\sqrt{29}$

b. (0,-1,2,3)

```
sage] v= vector([0,-1,2,3])
```

```
sage] v.norm()
```

$\sqrt{14}$

c. (-1,-2,0)

```
sage] t= vector([-1,-2,0])
sage] t.norm()
```

$\sqrt{5}$

d. (-1,2,-3,-4)

```
sage] f= vector([-1,2,-3,-4])
sage] f.norm()
```

$\sqrt{30}$

27. Determine un vector unitario para:
a. x=(2,-1,3)
El vector unitario seria:
u= 2i+(-1j)+3k
b. x= (1,2,3,4)
El vector unitario seria:
v=1i+2j+3k+4p
c. x=(0,1,-1)
El vector unitario seria:
t=0i+1j+(-1k)
d. x=(0,-1,2,-1)
El vector unitario seria:
d=0i+(-1j)+2k+-1j
28. Determine el vector unitario:
a. x=(1,2,-1)
El vector unitario seria:
u=1i+2j+(-1k)
b. x=(0,0,2,0)
v=0i+0j+2k+0h
c. x=(-1,0,-2)
El vector unitario seria:
t=-1i+0j+-2k
d. x=(0,0,3,4)
El vector unitario seria:
e=0i+0j+3k+4p